

of the 'Challenger' Report (p. 269), inasmuch as that sign means that the species was "previously known, but found in the district for the first time by the 'Challenger';" and, on his own showing, he had seen in the British Museum, some ten years previously, specimens from Masbate and the Philippine Islands.

The preceding remarks show into what confusion the species of this genus, with a literature more scanty than most, have been allowed to fall, and the thanks of systematic naturalists are due to M. de Loriol for directing attention to its condition.

XIII.—*On new Stylasteridæ, with Remarks on some recently described Forms.* By J. J. QUELCH, B.Sc. Lond., Assistant, Zoological Department, British Museum.

THE four species herein described as new are founded on specimens in the collection of the British Museum. Special interest is attached to *D. breviserialis*, owing to the very great obliteration of the lateral furrows of cyclo systems, except at the distal parts of the cœnosteum; and also to *Allopora ochracea*, in which the number of the dactylozooids in each cyclo system is very limited, being usually only three or four. The locality of *Stylaster pulcher* is specially interesting among the Hydrocorallinæ. In describing the colours of the specimens I have had reference to Werner's 'Nomenclature of Colours.'

Allopora ochracea, n. sp.

Cœnosteum of a reddish-orange ochre colour, branched, compact, irregularly flabellate; branches thick, spreading, slightly flattened and obtuse at the ends; surface nearly smooth or finely granulated; cyclo systems closely placed on all parts, often in irregular series, being about .5 millim. to 2 millim. apart, of very variable structure, but not raised above the general surface of the cœnosteum; dactylo pores very few in each system, variable in number, from 1 to 5, generally 3 or 4, very rarely absent, small, subcircular, placed irregularly around the gastropore, with cavities always distinctly separated, and occupied by a relatively large hirsute style; gastropores about .4 millim. in diameter, circular, rather deep, with a thick, rather short, hirsute style; ampullæ large, about 1½ millim. in diameter, vesicular.

Hab. Unrecorded. B.M.

The specimen to which this specific name has been given consists of a small broken portion of a rather massive structure—a short branch with four short chief branchlets, on different parts of which there are indications of still smaller branchlets. In the sum of its characters it differs altogether from all other known species, though in many points its close affinities with *A. californica*, V., *A. venusta*, V., *A. miniata*, Pourt., and *A. nobilis*, K., are clearly seen. Its thick and massive structure, its cyclo-systems placed on all sides of its branches and not raised above the surface, its few dactylo-pores in each system (generally 3 or 4), its rather short thick style in the gastropore, and its reddish-orange ochre colour are its essential characters, and will serve to mark the species with certainty. As the specimen is simply a broken branch, the details of the *form* of the entire cœnosteum must await description from a more perfect specimen; but it is probable that it will be found to agree very closely with *A. nobilis*, K.

Stylaster pulcher, n. sp.

Cœnosteum of a yellowish vermilion or bright tile-red colour, much branched, somewhat flabelliform but very irregularly so, branches not coalescing, surface very finely marked with whitish striations, especially on the basal parts; main trunk and branches rather thick, rounded or very slightly compressed, regularly diminishing and giving off many short branchlets, but these are not very small or delicate; cyclo-systems arranged in two rows on opposite sides of the branches, but this is often disturbed, and many are found scattered over the surface of the cœnosteum, very few towards the basal parts of the main trunk, many having given rise to branchlets, very variable in size and structure, subcircular or elongate, prominent but never pedicellate, about .75 millim. in diameter, often much smaller, about 1.25 millim. apart in the same row; dactylo-pores generally about 8 to 10, frequently less, very rarely 11 or 12, small, with minute styles, often unequally placed around the gastropore so as to give a varying thickness to the pseudosepta; gastropores very deep, rather wide, with a distinct short brush-like style; ampullæ forming circular swellings, rather paler than the axis in colour, about 1 millim. in diameter, placed on all sides of the branchlets, and giving them a rough swollen appearance; many small pores, about the size of the dactylo-pores, occur scattered over the surface of the cœnosteum.

Hab. Enoshima Island, Japan. B.M. (presented by Dr. F. J. Burge).

This species is closely related to *S. elegans*, V., *S. tenuis*, V., and less so to *S. obliquus*, Stud., but its differences are well marked and easily separate it. The larger of two specimens in the collection is about 5·5 centim. high, its base being about 6 millim. thick and its branchlets about 1·5 millim. thick close to their extremities. Many large swollen ampullæ occur on this specimen, being quite absent on the smaller. On this smaller specimen, however, there occur on the branchlets many small, raised, white porous masses, which are very rarely present on the larger specimen, and which, when scraped away, reveal circular cavities in the cœnosteum. These are markedly different from the large, coloured, non-porous ampullæ.

Distichopora breviserialis, n. sp.

Cœnosteum of a rather deep flesh-red or pale aurora-red colour, branched, very compact, irregularly flabellate, with the surface granulated, roughened, and minutely canaliculated; branches often coalescent, rather short, thick, uneven, often twisted, almost round above, but much compressed, at the base especially, where three or four branches arise together in the same plane; branchlets very short, thick, and obtuse, of a deeper colour than the rest of the cœnosteum; cyclo systems almost entirely absent from the main branches and the basal parts of the longer branchlets, primarily developed on opposite sides of the branched cœnosteum in well-marked furrows, as indicated on the extremities of the branchlets, but becoming obliterated by growth, except where incipient branchlets are present on the main stem and branches and at the extremities of the long branchlets; at these extremities the dactylo pores, which are very small, are generally situated on raised lateral ridges on each side of the furrow, with many smaller pores on the face of the branchlets, but these gradually disappear by overgrowth; the gastropores are very irregularly shaped, large and small often alternating at a distance apart about equal to their diameter, with deep, long, and thin styles, finely plumose; large, swollen, distinct vesicular ampullæ are absent, but on many parts of the branches and branchlets occur rough masses of small irregular cells, often open, which seem to be ampullæ.

Hab. —? B.M.

The specimen of this species consists of a cœnosteum about 7 centim. high, with six main branches, the thickness of which is about 7 millim. at base, being much wider in the plane of the flabellum. Many of the branchlets are broken off

and others were dead when the specimen was taken. The species has many points of affinity with *D. rosea*, Kent, but differs strikingly in the structure and position of its cyclo-systems and its colour, *D. rosea* being almost of a deep peach-blossom red, with well-marked furrows throughout the cœnosteum, although these are often irregularly interrupted, and with large elongated dactylopores. It seems probable that Tenison-Woods, who himself was doubtful of the identification, has mistaken this form for *D. rosea*, K., since the additional characters which he has given belong to this species and not to *D. rosea*.

Distichopora Milesii, n. sp.

Cœnosteum of a dull lake-red colour, branched, flabellate, compact, very slender, with an uneven granulated surface, irregularly canaliculated; branches very small, even at their base, rounded; branchlets short, small, obtuse, slightly compressed at the tips, and somewhat smaller than the branches; cyclo-systems arranged evenly on opposite sides in very distinct, deep, continuous lateral furrows; dactylopores small, placed in a line on the edges of the furrows, very elongated in a direction at right angles to this line; gastropores often unequal, placed very close to each other, with but a narrow partition between them, having long, deep, thin, and finely hirsute styles; ampullæ in raised crowded masses in which cells are almost undistinguishable, giving a warty appearance to the cœnosteum.

British Museum: received in exchange from the Brighton Museum, through the kindness of Dr. Miles of Brighton, after whom, in acknowledgment, the species has been named.

Hab. South Sea Islands. The exact locality is unknown; but as the specimen was growing on the same piece of rock as a very fine *Stylaster stellulatus* (Stewart), a species which has hitherto been recorded only from the Society and Paumotu Islands, it is probable that it was obtained in this region.

The specimen of this species is about 3 centim. high, the branches and branchlets being about $2\frac{1}{2}$ and $1\frac{1}{2}$ millim. thick respectively. The only species to which it seems to be closely related is *D. fragilis*, Dana; but the description of this is so short, and its details so few, that its identification becomes somewhat uncertain. Judging, however, by the figures of *D. fragilis* in the 'Atlas,' which do not seem to me to represent one species, *D. Milesii* can be easily distinguished by its dull lake-red colour and its rounded branches. Although agreeing somewhat in colour with *D. coccinea*, Gray, yet its much more delicate and rounded form, and the structure of

its cyclo-systems separate it widely, even from small specimens of that species.

Distichopora livida, Tenison-Woods.

This species was first described by the Rev. J. E. Tenison-Woods, in the Proc. Linn. Soc. New South Wales, vol. iv. 1879; and in his valuable monograph of the genus (Journ. Roy. Soc. N. S. Wales, 1879) that author gives further details of its structure. It is to be regretted, however, that a more definite term than "livid" was not given in the description of the colour of the main portion of the cœnosteum, since this furnishes such a valuable help in the determination of the species. Judging by specimens in the British-Museum collection, which seem to belong to this species and of which the locality is unknown, the colour varies considerably from dull or pale purplish red to dull reddish or brownish orange, having the extremities, as given in the description of the species, white, yellow, or orange, and the lateral furrows and incipient branchlets bright red or orange. If this identification is correct, it will be seen how closely this species is related to, if indeed it is distinct from (which may fairly be doubted), *D. nitida*, Verrill, which comes from the same locality, and the description of which Tenison-Woods had had no opportunity of consulting. If, however, the strict meaning of *lividus* was intended, *i. e.* bluish or black and blue, then this species presents a most remarkable variation in colour, and certainly would seem to be distinct from any yet described; and although stated to be very common in collections made in the neighbourhood of the Solomon and Marshall Islands, it is absent from the large and very fine collection of Stylasteridæ in the British Museum.

Distichopora nitida, Verrill.

Distichopora nitida, Verrill.

Distichopora Brasseyi, Bryce Wright.

Distichopora Allnutti, Bryce Wright.

It seems advisable to state here, in order to prevent misunderstanding and further complication in the synonymy of the species, a few facts concerning the characters and distribution of *D. nitida*, V., which must have been known to any one who had read the description of the species.

The specimens of *D. nitida* described by Verrill in the Bull. Mus. Comp. Zool. vol. i. no. 3, published in 1864, were collected by A. Garrett, at *Ebon Island* (Marshall Islands), and although described in the old terminology before the brilliant researches of Prof. Moseley revealed the true nature

of the Stylasteridæ, yet the *main* characters as given in the old description are sufficiently striking.

The following are selected from it:—"Corallum flabelliform, branching dichotomously in a plane; branches round or flattened transversely; branchlets obtuse, often compressed at the tips; surface very minutely granular, appearing almost smooth, with scattered patches of rounded verrucæ; three rows of minute pits arranged closely in regular series along the edges of the branches, those of the central larger row circular, often having a slender columella in the centre; lateral ones much smaller, generally irregular in form; colour bright red, tips of the branches yellowish white; other specimens are light orange."

From this it will be seen that even in the specimens described by Verrill the variations of colour were remarkable, ranging from bright red to light orange.

In the Ann. & Mag. Nat. Hist. 5th ser. vol. ix. (1882), p. 74, in a paper "On some new Species of Corals," in which this species was redescribed as *D. Brasseyi* and *D. Allnutti*, it is stated that the *habitat* of *D. nitida*, with the many species described by Pourtalès, is the *Gulf-stream and in and about the West-India Islands and Florida*; while its colour is indicated as being of a *whitish* tint, and is contrasted with the vivid colours of the Pacific species, from the list of which *D. fragilis*, *D.*, and *D. livida*, Tenison-Woods, are omitted!

It is scarcely to be wondered at that, having so little knowledge of the characters and distribution of the species, the author of this paper should have redescribed it under two new specific terms.

Where the colour in the same species, and more especially in the same specimen, varies so extremely, it is confessedly a difficult matter to name the combination in such a way as to convey exactly to another what is intended; but the specimens of *D. nitida* which have so lately been described as *D. Brasseyi* and *D. Allnutti* seem to present unusual difficulty; for in one place they are given as being "of a fuscous or deep foxy-red orange and of a pinkish orange respectively," while in another they are "fuscous orange-red in colour, paling towards the extremities," and "deep red, tinted or slightly mottled with orange at the extremities of the stems and adult branches, paling off into white and pale orange-yellow."

The specimens collected by Lady Brassey were from the Gilbert Islands, a group in the immediate vicinity, and south of Ebon Island; and though they certainly are unique and

most interesting in point of size, no sufficient character has yet been given which would separate them into different species. Indeed the very characters most insisted upon are those which seem most certainly to point to their identity with *D. nitida*, Verrill.

Distichopora coccinea, Gray.

In his monograph of the genus, the Rev. J. E. Tenison-Woods has given a figure of this species, and states that he does not think the species has yet been figured. It may be pointed out that when the species was described by Dr. Gray it was also figured (Proc. Zool. Soc. 1860).

XIV.—*Contributions to Micro-Palæontology.*—Notes on some Species of Monticuliporoid Corals from the Upper Silurian Rocks of Britain. By H. ALLEYNE NICHOLSON, M.D., D.Sc., Regius Professor of Natural History in the University of Aberdeen.

[Plate VII.]

IT has long been my intention to give a detailed account of the microscopic structure of the Monticuliporoid Corals of the Wenlock Limestone of Britain, so far as known to me. I have found, however, that the accomplishment of this would demand more time than is at present at my disposal; and I therefore, in the meanwhile, publish the following notes on the minute structure of some of the commoner Wenlock Monticuliporoids*, in the hope that they may prove useful to other workers in the same field. From the brief descriptions and accompanying figures of structure, it will, I think, be found easy to recognize the types which I have had under observation, and this is the special object which I have had in view. On the other hand, I have found great difficulties as to the nomenclature of the forms here described, and I have not been able to clear up these difficulties to any extent. The earlier observers of these fossils, as, for example, Mr. Lonsdale, necessarily founded their names upon macroscopic cha-

* Besides certain ramose Monticuliporoids which I have as yet imperfectly examined, the Wenlock Limestone contains various incrusting forms (such, for example, as the curious type figured by Milne-Edwards and Haime under the name of *Monticulipora papillata*), which require for their elucidation a more detailed investigation than I have hitherto been able to undertake.